PORT OF LIMERICK.

REPORT of *Thomas Rhodes*, Esq Civil Engineer, upon the Port of *Limerick*, for the purpose of making FLOATING DOCKS.

TO COLONEL BURGOYNE, &c. &c. &c.

SIR,

AGREEABLY to your instructions communicated to me on the 15th April, by order of His Excellency the Lord Lieutenant, to furnish Plans, Report and Estimates for improving the port of Limerick, I proceeded to make the necessary investigation and survey, and find that it can be effected at a small comparative outlay, affording ample accommodation for all classes of vessels likely to resort to this place for trade, which might lie afloat, and take in and discharge their cargoes with facility and expedition; and also for vessels driven in by stress of weather, and wanting repairs, instead of being obliged, as they now are, to run for Cork, Waterford, or the Bristol Channel.

Limerick is the principal city, emporium and chief market for the whole of the west of Ireland; it is situated upon the south bank of the River Shannon, at the termination of the estuary or tideway, distant from the Atlantic Ocean 70 miles. The upper part of the city, called New Town, is of modern erection, the houses spacious and well built, and the residences of the most respectable inhabitants and merchants; the streets are wide and well lighted. The other part, called the Old Town, presents a different aspect, being mostly old and dilapidated buildings; its streets are confined and narrow, and badly kept in repair, and not being lighted at night, it presents a gloomy appearance. The only thoroughfare at present leading to the counties of Clare and Galway, is through this part of the city passing over Thomond Bridge. This structure is composed of 14 arches, and is very ancient, said to have been built by King John, and is in a most dilapidated state; it would seem to be advisable, when the roads over the Wellesley Bridge and the Athlunkard Bridge are completed, that it should be taken down and rebuilt (in a manner better calculated for the discharge of the Shannon waters), and the approaches improved.

The population of Limerick (according to the last census, 1831), is 67,575 inhabitants, chiefly engaged in agricultural pursuits, and the business of the port; the staple manufactories being of a very limited description, and appearing to receive but little encouragement: there is one extensive distillery, two small iron founderies, and a little done in the glove trade, for which it was once so celebrated, and a lace manufactory.

Great quantities of grain, flour, oatmeal, butter, beef, pork, &c. are exported annually to the English and other markets, which, according to the statistical returns of last year, amounted to 1,005,726*l.* 13*s.* sterling; the imports were also extensive, amounting to 289,595 *l.* 12 *s.* sterling, both of which are very much on the increase as compared with former years, and there is every prospect of a continued increase, as advances are made in the improved system of the cultivation of the soil, which is generally so rich and productive; and by superior lines of communication, affording an easy means of transit for the various produce.

The port and quays afford very indifferent accommodation for the shipping, they having to lie aground at low water each tide upon the hard bottom, which is chiefly composed of solid limestone rock, producing great injury to laden vessels, particularly to sharp-built craft. Ships of from 300 to 400 tons burthen, laden with timber, &c., are obliged to discharge their cargoes in the *pool*, about a quarter of a mile below the city, in about 1½ fathom water, for the purpose of lightening them a little; discharging them at this distance is attended with considerable extra expense; coasting vessels of light draft, say 13 to 14 feet, have frequently to unload part of their cargoes at the lower quays; and when thus lightened, they proceed to the next, and so on to discharge the remaining part; the various quays are private property, and in such cases the charges become exorbitant

tant for wharfage. This risk, detention and expensive mode of doing business, is much against the interests of the merchants and traders of this city, and is a means of deterring merchants from chartering their vessels for Limerick.

An Act of Parliament was obtained in the year 1823, for constructing a bridge and a floating dock (the works were commenced in 1824), neither of which are yet completed. As regards the floating dock, when finished, it appears far from adequate for containing even the tenth part of the shipping that would resort to this port, if accommodation was afforded for their safety.

To obviate these difficulties by providing a safe harbour for shipping, is the object of this inquiry; and to accomplish so desirable an end, I propose to construct a dam or weir across the river at Kelly's Quay, to dam up the water*, and thus convert all that part of the river above into *floating docks*, which will be more fully understood by an inspection of the accompanying drawings.

The General Plan No. 1, exhibits the port of Limerick, with the various quays along the river, Wellesley Bridge, and the proposed docks as projected in 1823, Thomond Bridge, Baal's Bridge, part of the Abbey River, and the entrance to the Limerick Navigation, &c. &c.

The soundings describe the depth of water in the various parts above the proposed weir, taken from a datum line, 15 feet above the sill of Wellesley Lock, and those below the weir at low water, datum line two feet above the sill of Wellesley Lock. Mooring buoys are described in the centre of the docks both above and below the bridge, for vessels laid up, waiting for cargoes, rigging or slight repairs, thus leaving the quays free for the working of other vessels; the vessels described on the Plan, are of large dimensions. The projected improvements for the docks and quays are tinted red.

The proposed weir at Kelly's Quay is intended to be placed at right angles to the river, in form of a segment of a circle, whose chord is 500 feet, and versed sine 100 feet, to be built as described on plan and sections, the upper surface to be 15 feet above Wellesley Lock sill, which level will be extended to the Limerick Navigation, and to Thomond Bridge. It is also proposed to construct 13 openings in the masonry of the weir, each four feet by three feet, a little above low-water mark, and each to be furnished with a cast-iron sluice, and proper machinery for working the same; these sluices are intended for the purpose of regulating the height of the water in winter time when the floods descend, or as necessity may require; and also for the purpose of scouring out the docks, and carrying away any sediment that may have accumulated at the bottom, or be held in suspension by the lower stratum of fluid; in summer time, when the water is low, these sluices may be closed, as in that season but little head of water will pass over the weir.

For the convenience of approaching and working the sluices, it will be necessary to construct a foot bridge across the dam, to be supported by light pillars of masonry, or by cast-iron vertical frames, and covered with planking, finished by a neat iron railing; this bridge would also form a communication for the increasing population of this part of the town, and a necessary connexion between the locks; it will also be a great convenience for the persons connected with the shipping.

It will be necessary to construct two locks, one at each end of the weir, the sills to be three feet under low-water mark; these locks should be 180 feet long, and 40 feet wide, or one of them might be 45 feet wide, to admit the largest class of steam vessels; the gates to be provided with four sluices each, for the purpose of scouring the docks at low water; but for the more effectual performance of this operation, the lower gates on each side might be constructed upon the balance principle: by adopting these improvements, the gates would not be required at the Wellesley Lock, which might be appropriated to these.

By having two locks, the one might be used for the admission of turf boats, and small craft, and the other exclusively for large vessels; either might be used in case of derangement or repairs being wanted, which would always insure access to and from the docks at the different states of the tide.

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* Similar in effect to what is now done at Curragower and Golden Mills.

When the tide is out, the weir will retain a sufficient depth of water to float the largest vessels which are likely to trade to this port, and might lie alongside the quays below Wellesley Bridge; viz. Harvey's Quay, Russel's, Kelly's, &c. &c. Smaller craft, not drawing more than 12, 13 or 14 feet, would find accommodation above the bridge; viz. at Spaight's, Arthur's and the Custom-house Quays.

By these arrangements, the canal vessels from the Limerick Navigation would be enabled to ply at all times to and from the docks, and load and unload their cargoes from the quays or any of the vessels lying in the harbour, producing a great saving in cartage and other expenses.

The bottom of the present river course to form the proposed docks will require to be excavated and levelled along the present quay walls to one foot below low-water mark, from the proposed weir to Wellesley Lock on the south side, and the same on the north side; and it will be requisite to build a quay or retaining wall from the intended lock to join the wall now building, connected with the bridge works.

From the upper gates of Wellesley Lock, along Spaight's, Arthur's and the Custom-house Quays, the ground must be excavated to one foot below the sill of the gates, and the same must be done on the north side of the river, clearing away Curragower Mill and weir; and a retaining wall must be built from Thomond Bridge to connect and continue the line to Wellesley Bridge.

The whole of the old quays, which are represented by a blue tinted line, form at present a very irregular and indented line; and it would seem advisable to purchase this property, take down the walls and rebuild them according to the form represented on the Plan, and coloured red; the old materials would go far in rebuilding them. Upon the new line of quays, bonded warehouses, grain stores, &c. might be erected, and the whole enclosed by a wall, leaving a cartway at the back (for taking in or delivering the various produce) to be approached by gates from the streets, as described on the Plan; this would form one continued line of quays from Kelly's Quay to the Custom-house, and the warehouses or stores might be erected nearly in a line with the front of the quays, supported by columns, which would form a piazza; and goods might be landed by means of cranes, examined and housed dry immediately from the vessels; grain also might be shipped off in bulk with great facility by means of shoots, descending from the stores into the vessels, which would save great labour and expense in cartage, &c. as compared with the present method of having stores in the centre of the town; these arrangements, it is conceived, would be advantageous both to the merchants and official persons connected with the customs. The quay walls would require protecting by timber defenders, placed at convenient distances, and having mooring rings to secure the vessels. A provision has been made in the Estimate for a sewer at the back of the quay walls, to convey the drainage and discharge it below the proposed locks.

As graving docks or slips are much wanted at this port for the repairing of vessels, I have described on the Plan No. 1, convenient situations for these purposes on the north side. Near to the Shelbourne road is the proposed site for a dockyard, with two slips or inclined planes, and a graving dock, which could take in vessels at all times; and on the south side, immediately below the lock, is a site appropriated for another graving dock, which could take in vessels at or near high water. It is conceived that these conveniences would be an additional means of increasing the trade and revenue of the port, and of giving employment to a great number of its inhabitants.

The erection of the proposed weir will give a considerable fall of water, and offers superior situations for two tide mills, which might be employed for any manufacturing purposes; an elevation and plan of these mills are described upon the Drawing No. 2. A portion of the power of one of these mills might be advantageously employed in pumping water, to be conveyed through iron pipes into a reservoir that might be constructed on the elevated ground near to the *military barracks*, and thus the town could be supplied with soft water, which, by filtration at the reservoir, could be distributed to the inhabitants in a pure state; the situation here described is sufficiently elevated to discharge the water to the tops of the highest houses, being, according to levels taken, 65 feet above the high-water mark. This would be a valuable increase to the health and comfort of the inhabitants, and its want has been long and severely felt, the city hitherto having been supplied by water-carts from the river and springs*, and by small pumps, yielding water of an unwholsome quality, being strongly impregnated with sulphate of lime (as I am informed by a medical practitioner); this is particularly unhealthful to strangers visiting this city, and is frequently the cause of much suffering to the troops stationed here.

These mills, if constructed, would be of great value, and would be much more than a substitute for the two mills of Curragower and Golden above, which would necessarily be stopped by the erection of the proposed works. Hogan's Mill, situated near the canal, would receive no injury; and Corbally Mill, near the salmon weir, would rather be enhanced in value, as the removal of the weirs and mill at Curragower, and clearing under the arches of Thomond and Baal's bridges, will tend to lower the head of water, and free the tail-race of these mills.

On No. 1 Plan, is exhibited a line of embankment on each side of the river, (below the proposed weir,) for reclaiming considerable tracts of waste land, which if executed would yield a profitable return. The general surface of this land is from five to six feet under the high-water mark of spring tides; the embankment on the north side is just begun, and if a corresponding line was made on the south side, it would much improve this part of the river, besides reclaiming the land; and when these embankments are completed, the slope next the river being faced with stones, the other planted with trees, and the top gravelled and protected, they will form fine esplanades for the healthful exercise of the inhabitants, heightened by the pleasing appearance of the cascade, and the entrance to the docks. The land thus reclaimed could be drained, and the water discharged by tide sluices through the embankments, as described upon the drawing †. This land would form excellent pasturage or gardens, the soil being a fine alluvial deposit, chiefly of a calcareous nature; this is a fortunate occurence, as it seems very probable that Limerick will quickly be extended in this direction, and its respectable inhabitants will be induced to occupy villas, &c. built upon the banks of the Shannon, in this vicinity.

Great improvements might be effected upon the river below Limerick, as already described in the Report by Captain Mudge, and I would beg to submit, that, in addition to his valuable suggestions, if groins or projecting walls were constructed in some of the wide and irregular parts, where it is not prudent to embank, so as to leave the river nearly a parallel width, a mid-channel current would be produced, which would scour out the mud and other matter from the bottom, and thus keep a clear waterway, and give a greater depth up to Limerick. Very much has been done in this manner of late years, upon the rivers Clyde, Dee, &c. &c., and many other rivers in Great Britain, producing an astonishing effect in the course of a few years, and has been the means of increasing the trade and wealth of those places to a great extent; and it is not too much to suppose that the same results would be obtained on the River Shannon, if a similar spirit of enterprise and speculation was entered into by the merchants and landed proprietors connected with the city of Limerick.

Excellent materials in limestone, suitable for building purposes, and for the projected works, are on the spot, requiring only the labour.

In forming the Estimates a considerable degree of care has been taken in obtaining the correct quantities, and the prices attached to each are such as would leave a fair remunerating profit for the due execution of the several parts specified.

The valuation of the different properties that would have to be purchased are estimated from the best information I could obtain, calculating from an annual rent, at 20 years' purchase.

I have the honour to be, Sir,
Your obedient servant,

Limerick, 7 June 1833. *Thomas Rhodes.*

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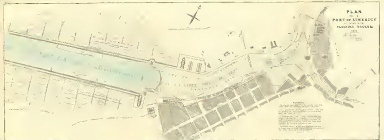
* A plentiful supply of good pure water may be obtained about from three to four miles on the Tipperary and Waterford Road, and might be conveyed in conduits to the city.

† The tide sluices in the embankments about Limerick are very inefficiently executed, thereby not performing the drainage in an effectual manner.

ESTIMATE.

	£.	s.	d.	£.	s.	d.
Docks and Quay Walls:						
188,035 yards, cube.—Excavation to level the bed of the river, including the excavation to level the bottom for the proposed weir and locks, (partly rock in a loose state) - - - - - -	9,401	15	–			
21,357 yards, cube.—Rubble masonry in quay walls from the proposed weir to Thomond Bridge -	10,678	10	–			
No. 232.—Timber defenders to face of walls - -	928	–	–			
No. 80.—Mooring rings - - - - - -	320	–	–			
No. 24.—Mooring buoys - - - - -	960	–	–	22,288	5	–
Weir and Foot Bridge:						
16,800 yards, cube.—Rubble masonry - - - -	11,340	–	–			
2,488 yards, cube.—Ashler work to face and top of weir - - - - - - - - - -	2,799	–	–			
Extra to 13 tunnels worked through the masonry of the weir for the regulating sluices - - -	390	–	–			
2,240 feet cube fir timber in foot-bridge over weir -	448	–	–			
Thirty-three tons of cast iron in 22 frames, to support the bridge - - - - - - -	462	–	–			
1,120 feet run, wrought iron balustrade and handrail, including sockets and bolts, &c. for fixing, complete - - - - - - - - - -	560	–	–			
No. 13.—Regulating sluices of cast iron, 4 feet by 3 feet, faced with brass, iron spear rod and guides, rack and wheel work, fitted up complete - -	1,300	–	–	17,299	–	–
Locks:						
7,045 yards, cube.—Rubble work in backing and contreforts - - - - - - - -	4,755	7	6			
3,775 yards, cube.—Ashler work to face of walls, hollow and quoins, square quoins, &c. - -	4,246	17	6			
902 yards, cube.—Filling in and puddling between walls and behind contreforts - - - - -	56	7	6			
Two pair of timber gates, with machinery, foot-bridges and sluices, opening gear, &c. complete	3,200	–	–			
Four capsterns - - - - - - - -	120	–	–			
Six mooring posts - - - - - - -	24	–	–			
For one lock - - - - £.	12,402	12	6			
			2			
For two locks - - - - - -				24,805	5	–
1,400 yards run of sewer from Arthur's Quay, to discharge the drainage below the proposed weir - - - - - - - - -				1,750	–	–
Purchase of property to form the proposed quays, the rentals amounting (as nearly as can be ascertained) to 500 *l.* - - - - -				10,000	–	–
Contingencies, at 10 per cent. - - - - - - - -				6,614	–	–
TOTAL Amount - - - - £.				82,756	10	–
From the above sum - - - - - - - - - -				82,756	10	–
May be deducted the amount of gates, as estimated for the Wellesley Dock - - - - - -	5,026	–	–			
Ditto, amount of wall, as estimated to form the Custom-house dock - - - - - -	24,000	–	–	29,026	–	–
£.				53,730	10	–

Thomas Rhodes, C. E.


PLAN
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